

AUG 03 2006

Attorney Docket No.: Fleute-1/N0652-120

REMARKS

1. Claims 1 and 4-20 are pending and stand rejected. This paper amends claims 1, 13, 15, 17, and 19; and cancels claims 14, 16, 18 and 20.

Reconsideration of this application is respectfully requested.

2. Claim 1 stands objected to because the phrase "iteratively, until the contours of the model are such that the intervals between back-projection rays of the image contours in two dimensions from the source and the model surface are minimum, to obtain a correspondence between the model and the image" is difficult to read and unclear.

In response, claim 1 has been amended to recite,

A method for restoring a three-dimensional image representing the surface contours of at least one object, based on at least one two-dimensional X-ray projection of this object, the method comprising the steps of:

determining the position of the shooting source in a reference referential system;

selecting at least one statistical model defining an average shape of the object and its main deformations with respect to this average shape, the statistical model being calculated from an object population of a same type for which the statistical correspondence common to all objects is searched; and

selecting an orientation and a position of the model in the reference referential system by submitting the statistical model, successively, to a rigid transformation modifying its position and/or its orientation, then

selecting a deformation of the model to modify its contours in three dimensions, by submitting the statistical model to a non-rigid deformation modifying its surface contours,

wherein the orientation and deformation selecting steps are performed iteratively, until the contours of the model are such that the intervals between back-projection rays of the image contours in two dimensions from the source and the model surface are minimum, in order to obtain a correspondence between the model and the image.

In view of the amendment made to claim 1, the same is now easy to read and clear. Accordingly, withdrawal of this objection is respectfully requested.

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3. Claims 13-20 stand objected to because they depend from canceled claims.

In response, claims 13, 15, 17, and 19 have each been amended to depend from claim 1 and claims 14, 16, 18 and 20 have been canceled. Accordingly, withdrawal of this objection is respectfully requested.

4. Claims 1 and 4-20 stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,106,466 to Sheehan et al. (Sheehan).

Responsive thereto, claim 1 has been amended to recite "A method for restoring a three-dimensional image representing the surface contours of at least one object, based on at least one two-dimensional X-ray projection of this object... ."

In contrast, Sheehan discloses a method for reconstructing three-dimensional shapes based on a set of two-dimensional sectional images obtained with ultrasound. Sheehan does not expressly or inherently describe, teach or suggest a method for restoring a three-dimensional image representing the surface contours of at least one object, based on at least one two-dimensional X-ray projection, as currently claimed.

Furthermore, claim 1 requires alternating between rigid transformations and non rigid deformations, iteratively, i.e.,

selecting an orientation and a position of the model in the reference referential system by submitting the statistical model, successively, to a rigid transformation modifying its position and/or its orientation, then
selecting a deformation of the model to modify its contours in three dimensions, by submitting the statistical model to a non-rigid deformation modifying its surface contours,
wherein the orientation and deformation selecting steps are performed iteratively... .

Sheehan, on the other hand, merely applies one rigid and scale matching (see column 15, lines 16-19 describing FIG. 13) and then iteratively deforms the "mesh model".

Since Sheehan fails to expressly or inherently describe each limitation recited in currently amended claim 1, the same is allowable over Sheehan.

Remaining dependent claims 4-13, 15, 17, and 19, which recite additional features of the invention, are allowably over Sheehan for at least the same reasons stated for currently amended independent claim 1.

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In view of the foregoing, withdrawal of this rejection is respectfully urged.

5. Favorable reconsideration of this application is respectfully requested as it is believed that all outstanding issues have been addressed herein and, further, that claims 1 and 4-13, 15, 17, and 19 are in condition for allowance. Should there be any questions or matters whose resolution may be advanced by a telephone call, the examiner is cordially invited to contact the undersigned attorney at his number listed below.

6. The Commissioner is hereby authorized to charge payment of the fee for the petition for the two month extension of time and any additional filing fees required under 37 CFR 1.16 and any patent application processing fees under 37 CFR 1.17, which are associated with this paper, or credit any overpayment, to Deposit Account No. 04-1679.

Respectfully submitted,



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